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AUTHOR Lawrence, Gordon
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ABSTRACT

This review examines 97 studies and evaluation reports of teacher inservice education and generalizes about the characteristics of successful programs. The studies were classified into 14 categories, seven of which represent pairs of conflicting values about how inservice education should be structured. These categories classed activities according to whether they were individualized or common, self-directed or other-directed, programmatic or single-shot, and according to whether programs put teachers in an active or passive role, emerged from teacher needs or were preplanned, utilized supervised trials and feedback or expository design, or emphasized mutual assistance or individual work. Results indicated that inservice programs that have the best chance of being effective are those that involve teachers in planning and managing their own professional development activities, pursuing personal and collective objectives, sharing with each other, applying new learning, and receiving feedback. (Author/JM)

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PATTERNS OF EFFECTIVE INSERVICE EDUCATION

A State of the Art Summary of Research on Materials and Procedures for Changing Teacher Behaviors in Inservice Education

December 1974

Florida Department of Education
Division of Elementary and Secondary Education
Florida Educational Research and
Development Program

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EA 012 164

To The Reader: The state of the art of reviews of research on inservice education is primitive. To help advance the art I invite your suggestions, criticisms and any references to worthy studies not included in the review.

Gordon Lawrence
Gainesville
December 1974

Patterns of Effective Inservice Education
A State of the Art Summary of
Research on Materials and Procedures
for Changing Teacher Behaviors
in Inservice Education

When, now and then, inservice education really benefits teachers, what are the key ingredients that make the difference? Can generalizations be drawn from the research literature to indicate that some kinds of settings and materials and procedures are more effective than others?

The bulk of research on teacher education has concerned prospective teachers, persons not yet employed as teachers.[1] This review includes only research on the continuing education of employed teachers, that is, inservice education.

A striking variety of inservice education programs are reported in the research literature, but within the variety are patterns and commonalities from which generalizations can be made. The team undertaking this review found no previous review of research on inservice education. Having no precedent to follow, we began our work by deciding on criteria for including studies in the review and also by selecting factors with which to classify and organize the features of the various reports.

The decision was made to examine any research on programs for improving the professional competencies of employed teachers, whether the programs were college-based or school-based. Studies on programs

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[1] N. L. Gage (Ed.), Handbook of Research on Teaching (Chicago: Rand McNally, 1963). R. M. W. Travers (Ed.), Second Handbook of Research on Teaching (Chicago: Rand McNally, 1973).

for preservice teachers would be excluded. Research on graduate education programs not directed specifically toward improvement of professional teaching competencies would also be excluded. These decisions provided a functional definition of inservice education and set the scope of studies to be examined.

Those who write about inservice education have identified many ingredients or factors they regard as important, many more than could be used to classify studies in a review of this kind. We chose fourteen factors to serve as categories for classifying and analyzing the research reports on inservice education. The categories are: situational design, mediation, influence agent, objectives for teacher change, complexity of objectives, kinds of measurement used, research/evaluation plan and seven categories dealing with approaches to management of inservice education activities. These categories and the procedures used in selecting and classifying studies are described in detail below. The reader who prefers to bypass the description of procedures can turn directly to the subsequent section on findings.

PROCEDURES

Studies were classified into fourteen categories, five of which have multiple sub-categories. The sub-categories were not regarded as exclusive; that is, a study might be classified in as many of the sub-categories as were regarded as major aspects of the inservice program. The other nine categories are dichotomous, as shown below.

A. Situational Design. This is the institutional context and general curriculum pattern within which the inservice education took place. The first three are exclusively school-based, and the next two are exclusively college-based. The rest of the classifications may be either at a school site or a college site.

1. Workshop
2. Staff meeting
3. Visit/exchange
4. Institute
5. College course
6. Minicourse (a short course, with limited objectives)
7. Demonstration
8. Guided field trip
9. Cultural experience
10. Organized group study
11. Micro-teaching (typically, the practicing of teaching skills in mini-lessons with a few students)
12. Individualized study
13. Production (participants produce something, such as curriculum units)
14. Self-instruction
15. One-to-one (tutoring, individual guidance or supervision of the participant)

The categories workshop, institute and college course are very general categories, ones that frequently appear in the research reports. Most studies used those terms and did not specify other aspects of the situational design. Some studies were classified in more than one category, but the intent was to identify the dominant pattern or design for each study.

B. Objectives for Teacher Change

1. Cognitive/knowledge
2. Affective/attitude
3. Performance/behavior

C. Measurement Level. What general kind(s) of measurement did the study undertake?

1. Information (cognitive taxonomy level 1)
2. Conceptual (cognitive taxonomy level 2)
3. Affective
4. Command performance (when the performer knows what the observer is watching for)
5. Unconstrained performance (when the performer does not know what is being observed)
6. Consequence (when the teacher behavior change is measured in terms of some event or product that has been influenced by the teacher behavior)

D. Research/Evaluation Plan. Studies without some validity safeguards were excluded. Those included were classified in these sub-categories:

1. Experimental or quasi-experimental, incorporating a research design
2. Program evaluation, less controlled, relying on a questionnaire, interview, unvalidated test or checklist.

E. Mediation. This category refers to the instructional means by which influence is brought to the participant.

1. Modules (self-instruction packets)
2. Video tapes, audio tapes
3. Lecture/discussion
4. Simulation/games/structured group events
5. Books and other reading material
6. Multi-mediation (a combination of several means)
7. Observation system (used as a vehicle of instruction)

F. Influence Agent. This category classifies the person or persons who play an instructional role in the inservice activity.

1. Teacher (other than the recipient of the instruction)
2. Supervisor
3. Administrator
4. College consultant or instructor
5. Student teacher (as influence agent)
6. Other
7. Self-analysis or self-teaching

The next seven categories used for sorting and analyzing the research reports are substantially different from the other categories. They represent ideas, issues and conflicting values in the dialogue about how inservice education should be structured. They have been derived from an analysis of the book Improving In-Service Education, edited by Louis Rubin. The chapters by six eminent educators - Ralph Tyler, Philip Jackson, Robert Bush, Dwight Allen, Ronald Lippitt and Robert Fox - were analyzed to identify the key issues these authors see in the

designing of inservice education. These authors do a remarkably good job of conceptualizing the status of inservice education today and the work that is needed to improve it. The book does not attempt to review research in the field of inservice education, but because of the helpful perspective it provides it can be regarded as a conceptual parent of the present report.

The seven categories drawn from the book are stated as dichotomies, such that a given inservice activity is classified as either this or that. In a few cases, an inservice program was clearly divided in emphasis and those cases were classified in the theoretically "desirable" sub-category.

Approaches To Management Of Inservice Activities

G. Individualized teacher inservice activities versus common activities undertaken by a group.

H. Self-directed and initiated activities versus other-directed and initiated activities.

I. Inservice design that places the teacher in an active role, constructing and generating materials, ideas and behaviors versus the teacher in a receptive role, accepting ideas and behavior prescriptions not of his own making.

J. A heuristic inservice design, emerging from the needs of the teacher versus a preplanned design in which goals and activities are decided ahead.

K. An application design in which demonstration plus supervised trials and feedback are emphasized versus an expository design in which the teacher is expected to store up ideas and behavior prescriptions for a future time.

L. A design in which teacher mutual assistance and sharing are emphasized versus separate individual work, each for himself as the pattern.

M. A programmatic, common endeavor approach versus an approach which involves individuals alone or small groups, not linked to a general effort of the school - a single-shot design.

The last of the fourteen classifications was the reviewer's judgment whether the study involved complex, abstract objectives or relatively clear-cut, well defined, concrete ones.

In general, the format of the report follows the plan adopted by Berelson and Steiner in their book Human Behavior: An Inventory of Scientific Findings.

> The task of constructing this book was fourfold: to select, to condense, to organize, to translate. We had to select findings from the large body of available literature. We had to condense the conclusions of various studies into a single generalization that would do them justice. We had to organize the findings into a sensible and coherent form. Finally, we had to translate the technical language, and often the jargon, of the behavioral sciences into reasonably plain English without corrupting meaning.

Berelson and Steiner organized the research findings into three levels of generality and referred to them as "important statements of proper generality for which there is some good amount of scientific evidence."

> Just how much evidence is required to warrant inclusion here cannot be stated with much precision: the disciplines themselves have not settled what is "enough evidence" and in any event scientific standards vary from one segment of the field to another. But there must be some "hard" evidence for the finding, typically of a quantitative character, beyond simply an idea, concept, a hypothesis, an insight, or a case history. As a general rule, we have tried to include the best-supported findings... those we think most likely to be considered as established by a consensus of the professionals...
>
> We decided early on to dismiss speculation, impression, anecdotage, or insight as evidence, no matter how persuasive,

> no matter how brilliant or stimulating to us personally. Nor did we accept single case studies: we grant at the outset that any conceivable human behavior has in fact occured - somewhere, sometime. We asked for something more, and we tried to be guided by what passes for evidence among the more highly reputed practioners and journals...
>
> In the very nature of the case, the findings presented here are simplified: how could any summary of such a larger literature be otherwise? We hope they are not over- or unduly simplified, but the reader should also know at the outset that qualifications of various kinds are, or can be, attached to many, perhaps most, of the following findings. In the behavioral sciences, if not in human behavior, it is always "more complicated than that." The qualifications may derive from size of sample, composition of sample, level of proof, techniques of measurement, factors left uninvestigated, or other conditions, but they are usually there. Thus it seems only appropiate to warn that not all these findings are always operative just as stated, or rather that we do not yet know that they are. So, not everything that follows can be certified as "absolutely true."

These statements of Berelson and Steiner apply fully to the present review.

FINDINGS

When the profiles of ninety-seven studies are laid side by side, the first impression one has of the composite picture is the remarkable success rate reported for the inservice education programs that were studied. Four out of five report significant changes in teacher behavior. The findings seem to confirm the generalization that "you get what you train for," so long as the training is directed toward relatively clear-cut outcomes, and so long as the measurement of gain is made relatively soon after the training. The first impression is misleading, however, if one concludes from it that most procedures and designs stand a good chance of being effective

for most kinds of objectives. A closer examination shows clear evidence that differences in materials, procedures and design are associated with differences in effectiveness of inservice education.

Situational Design. As might be expected, most inservice education reported in these studies occurs in the school setting. The workshop is by far the most common format for inservice education that is reported in these studies. Two-thirds of the studies were conducted in school settings, and almost half of the reports concerned workshops. One-third of the studies were forms of inservice education sponsored by a college or university: institutes, regular college courses or minicourses. One-sixth of the reports concerned all other forms combined.

IA Inservice programs in schools and on college campuses are equally capable of affecting teacher behavior, but the school settings tend to be capable of influencing more complex behavior changes in teachers.

Fifty-four of sixty-three studies of school-based inservice programs reported significant positive changes in teacher behaviors, mainly classroom skills, and twenty-seven of thirty-two college-based inservice programs reported positive results. One important difference emerged: the kinds of objectives emphasized by the school-based and college-based inservice programs. Half of the college-based studies were directed toward changing the teacher's store of information or cognitive behaviors, while only one-fifth of the school-based studies had such objectives. The rest were directed toward changing teacher classroom performance skills. Of those studies we classified as dealing with complex teacher behaviors, school-based studies had a higher proportion that

attained the objectives (30 of 37 studies) than did the college-based studies (6 of 9 studies). Appendix A contains tables that display the particulars of the summaries given here.

IB Teacher attitudes are more likely to be influenced in school-based than in college-based inservice programs.

Three-fourths of the studies that had affective objectives reported significant changes in teacher attitudes (31 of 42 studies). Some of them measured changes in the short-term and some reported changes persisting over a full school year. College-based inservice programs had less success with affective objectives. Eight of fifteen studies reported significant results. Twenty-three of twenty-seven school-based studies reported significant changes in attitude.

IC Minicourses sponsored either by colleges or schools tend to emphasize the development and application of specific teaching skills (14 of 16 studies), with a corresponding lower emphasis on beliefs, values, concepts and information objectives. Minicourses have a high rate of success in achieving the specific skill objectives (14 studies with clear positive outcomes, 2 with mixed results).

Seven of the studies were associated with the development of a series of minicourses by the Far West Regional Educational Laboratory (11). These training units, designed for self-instruction by teachers in the school setting, have a sound record of effectiveness.

None of the other formats for inservice education showed a pattern of effectiveness materially different from that of the total group of studies.

Mediation. This category refers to the instructional means by which the participant is influenced. More than half of the studies were classified as multi-mediation, using a combination of several means. Twenty-eight studies reported lecture-discussion as the medium, and twenty-five studies reported the use of video and/or audio tapes. Books apparently play a very subordinate role in inservice education: only 12% of the studies made reference to books. Six studies concerned the use of modules or other self-instructional packets, and six studies reported use of simulations or other structured group activities.

IIA No medium of instruction is broadly inappropiate or distinctly inferior in the accomplishment of the objectives of inservice education.

With the exception of the findings of IIB and IIC, differences in effectiveness of inservice education programs cannot be attributed to the medium of instruction selected for the program.

IIB Video and audio taping are effective as means of influencing teacher behavior in classroom management skills (17 of 19 programs having teaching performance objectives; 6 of 7 programs having affective objectives).

IIC Studies of inservice programs that make specific mention of a book or books as a medium of instruction report a high degree of program effectiveness (9 positive outcomes, one mixed outcome out of 11 studies).

IID Training in the use of an observation system, such as Interaction Analysis, is effective in changing a teacher's capacity to perform certain verbal operations; but it is relatively ineffective in influencing teacher attitude and in influencing pupil behavior.

Thirteen studies concerned training in some observation system. Records of teacher verbal behavior in the classroom were taken before and after training in eleven of the studies. Ten reported significant gains in teacher verbal repertoire. Measures of teacher attitude change were made in four studies; two of them reported no significant change. Change in pupil behavior was recorded in six studies; three reported no significant change.

Influence Agent. The college influence in inservice education appears to be very strong. A majority of the school-based programs were conducted by college personnel or other agents outside of the school; and, of course, college personnel direct the college-based programs. It may well be that the resulting literature does not adequately reflect the proportion of school-based programs conducted by school personnel. Probably some of the research reports exist because of the institutional expectation that college personnel "do research" and publish, and it may be that a substantial amount of research conducted by school system personnel is visible and disseminated only locally.

IIIA School-based programs in which teachers participate as helpers to each other and planners of inservice activities tend to have greater success in accomplishing their objectives than do programs which are conducted by college or other outside personnel without the assistance of teachers.

Teacher involvement in planning and conducting programs in conjunction with outside personnel was reported in eight studies; significant positive results were reported in seven of them, mixed results in

the eighth. In thirty-four studies, the school-based programs were conducted by college or other outside personnel without the assistance of school personnel. Significant positive results were reported in twenty of those studies, mixed results were reported in eight, and no significant differences were reported in six of the studies.

The kinds of teacher involvement included planning, serving as tutors and discussion leaders, constructing materials together, and providing each other assistance and feedback in the development of new skills.

IIIB School-based programs in which supervisors or administrators serve as helpers and planners tend to be more successful in accomplishing their objectives (4 studies out of 4) than do programs which are conducted by college or other outside personnel without the assistance of supervisors or administrators (20 of 34 studies).

IIIC School-based programs conducted by supervisors and/or administrators have a record of effectiveness (5 studies out of 6) which exceeds that of school-based programs that involve college or other outside personnel (29 of 44 studies).

IIID School-based inservice programs that emphasize self-instruction by teachers have a strong record of effectiveness (17 studies, all recording significant gains).

Generally speaking, in these programs the teacher received prepared materials and planned guidance, and worked within a set of objectives or expectations rather than in a laissiez-faire situation.

Objectives Of Inservice Education. Of the ninety-seven studies reviewed, seventy-one had major objectives involving changes in overt teaching performance, forty had objectives concerned with teacher attitudes, and thirty had objectives that would be classified as cognitive or information objectives. Frequency of success in the attainment of these objectives follows a pattern that one would expect.

IVA Objectives of inservice education that deal with changing teacher's concepts or enlarging the teacher's store of information have a high rate of realization; objectives dealing with overt teaching behaviors are less often realized; and objectives involving changes in teacher attitudes or values are least often realized.

Of the thirty inservice programs having cognitive or information objectives, twenty-five were reported as accomplishing the objectives, three showed no significant differences, and two had mixed results. Of the seventy-one programs having overt performance objectives, fifty-five had objectives realized, fourteen had no significant differences reported, and two had mixed results. Forty-two studies involved affective objectives. The results were: thirty-one achieved the objectives, ten reported no significant differences, and one program had mixed results.

IVB The success rate of inservice education programs is substantially higher when change in teaching behavior is the criterion rather than when subsequent change in pupil behavior is the criterion.

Of thirty-six studies using pupil outcomes as a criterion, thirteen studies showed no significant differences in pupil behavior following an

inservice program for their teachers. However, seven of those studies showed significant positive changes in teacher overt behaviors or conceptions following the inservice programs. Only one of the thirteen studies had measurement of teacher behavior and of pupil behavior both significant in the negative direction. The rest of the thirteen studies had no direct measurement of teacher behavior.

Patterns Of Management In Inservice Education. Each study was classified into seven dichotomous categories concerned with approaches to managing inservice education. The seven classifications, described earlier, were derived from theories on inservice education. Theoretically, inservice programs that incorporated more of the seven desirable characteristics would have a greater likelihood of realizing their objectives. The findings support all seven propositions.

VA Inservice education programs that have differentiated training experiences for different teachers (that is, "individualized") are more likely to accomplish their objectives than are programs that have common activities for all participants.

VB Inservice education programs that place the teacher in active role (constructing and generating materials, ideas and behaviors) are more likely to accomplish their objectives than are programs that place the teacher in a receptive role (accepting ideas and behavior prescriptions not of his or her own making).

VC Inservice education programs that emphasize demonstrations, supervised trials and feedback are more likely to accomplish their goals than are programs in which the teacher is expected to store up ideas and behavior prescriptions for a future time.

VD Inservice education programs in which teachers share and provide mutual assistance to each other are more likely to accomplish their objectives than are programs in which each teacher does separate work.

VE Teachers are more likely to benefit from inservice education activities that are linked to a general effort of the school than they are from "single-shot" programs that are not part of a general staff development plan.

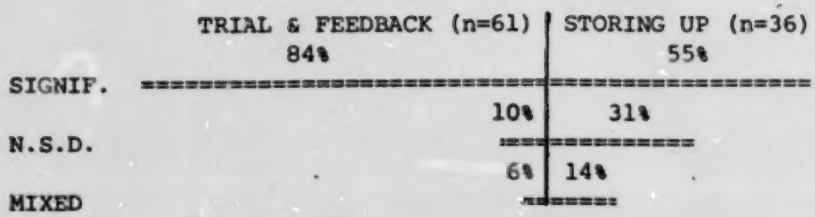
VF Teachers are more likely to benefit from inservice programs in which they can choose goals and activities for themselves, as contrasted with programs in which the goals and activities are preplanned.

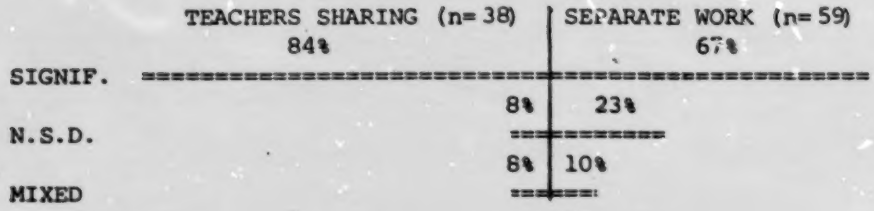
VG Self-initiated and self-directed training activities are seldom used in inservice education programs, but this pattern is associated with successful accomplishment of program goals.

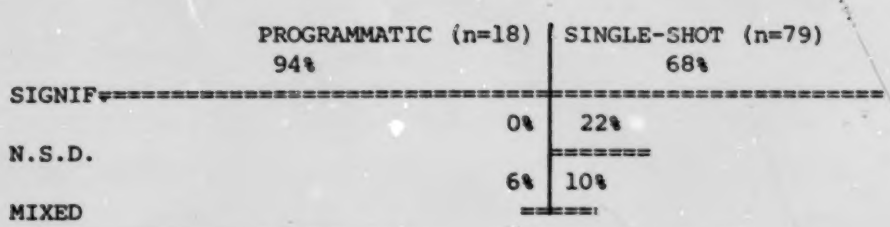
The table below displays the percentage of studies that had significant positive outcomes, showed no significant differences, and had mixed results, in each of the seven dichotomous classifications.

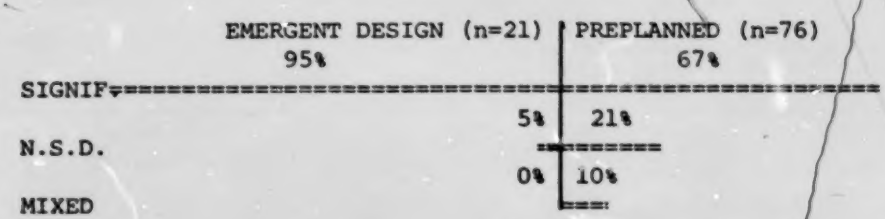
	INDIVIDUALIZED (n=43)	COMMON ACTIVITIES (n=54)
	80%	68%
SIGNIF.		
N.S.D.	10%	24%
MIXED	10%	8%

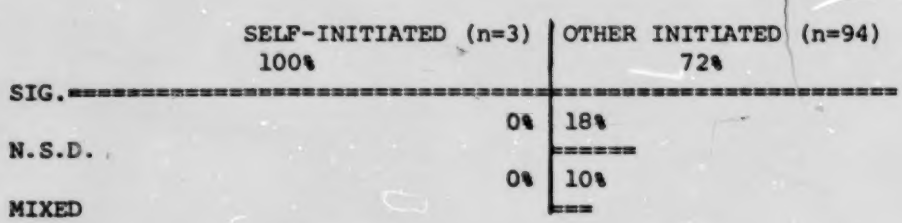
	ACTIVE ROLE (n=66)	RECEPTIVE ROLE (n=31)
	83%	51%
SIGNIF.		
N.S.D.	12%	29%
MIXED	5%	20%


TRIAL & FEEDBACK (n=61)
84%
STORING UP (n=36)
55%
SIGNIF.
10%
31%
N.S.D.
6%
14%
MIXED


TEACHERS SHARING (n=38)
84%
SEPARATE WORK (n=59)
67%
SIGNIF.
8%
23%
N.S.D.
8%
10%
MIXED


PROGRAMMATIC (n=18)
94%
SINGLE-SHOT (n=79)
68%
SIGNIF
0%
22%
N.S.D.
6%
10%
MIXED


EMERGENT DESIGN (n=21)
95%
PREPLANNED (n=76)
67%
SIGNIF
5%
21%
N.S.D.
0%
10%
MIXED


SELF-INITIATED (n=3)
100%
OTHER INITIATED (n=94)
72%
SIG.
0%
18%
N.S.D.
0%
10%
MIXED

Another way of viewing the importance of the seven program features is the frequency with which successful programs and unsuccessful programs incorporate the features. Inservice education programs that report significant positive changes in teacher behavior incorporate a higher mean number of the seven desirable features (2.9 of a possible 7) than do programs reporting no significant changes (1.0 of a possible 7). School-based programs incorporate more of the features than do college-based programs: 3.3 and 1.5 compared with 2.1 and 0.6.

Programs that were classified as incorporating four or more of the seven features have a strong record of accomplishing their objectives: twenty-four studies showed significant positive changes, one showed no significant change and one showed mixed results.

REFLECTIONS ON THE FINDINGS

If there are surprises in the findings, they spring not so much from the kinds of patterns that have appeared but from the strength of the patterns. Those who know the inservice education scene well, both theorists and practitioners, probably find their convictions confirmed in these data. But those who know the educational research scene can attest to the fact that different empirical studies seldom show as strong agreement as is present in these findings.

The message in the findings seems clear: the inservice programs that have the best chance of being effective are those that involve teachers in planning and managing their own professional development activities, pursuing personal and collective objectives, sharing, applying new learnings and receiving feedback.

The findings are useful in another way: they highlight some things that are missing from the 97 programs. None of them is a teacher ce

program. None of them were reported as involving a teachers' professional organization in the planning or conduct of the program. Only one set of studies reported use of protocol materials, and only six studies dealt with modules or similar self-instructional materials. Perhaps in a year or two research reports will be available on these kinds of experimental work.

Also missing is evidence of any of the human sciences other than psychology having an influence on the substance of inservice education. Two of the programs reviewed put teachers into contact with the community. None of the reports mentioned parents being involved with an inservice program.

The research reports also reflect another kind of narrowness of conception about inservice education. Four situational designs--workshop, institute, course and minicourse--accounted for nearly all the programs reported. We identified a dozen other designs that were very seldom employed. Four out of five programs had objectives that were pre-planned without the participants being involved in the planning. "Individualization" was reported for many of the programs, but it means that pace and sequence of instruction might vary from person to person; and in some cases participants had choices of learning activities. But the reports did not refer to efforts to differentiate inservice instruction for different participants on the basis of their learning style, personality differences, or teaching style.

Questions For The Future Of Inservice Education. In an article on priorities for inservice education[1], Roy Edelfelt asks 15 questions "that need resolution as we begin to deal with the future." Nine of them are reported below to point out how some of the findings of this review bear on decisions to be made about inservice education.

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[1] Edelfelt, Roy A. "Inservice Education of Teachers: Priority for the Next Decade," The Journal of Teacher Education, Fall 1974, pp. 250-2.

1. What are the purposes of inservice education?
2. How will inservice programs be determined and by whom?
3. Who will control or govern education?
4. How will inservice education be paid for?
5. Will or should inservice education become part of the teacher's job and be conducted on the employer's time?
6. What is the appropiate place for formal graduate study and for other forms of inservice education?
7. To what extent should inservice education be the individual teacher's responsibility-intrinsically motivated-and to what extent externally required and therefore extrinsically motivated?
8. How should inservice education be evaluated and by whom?
9. To what extent must the relationship between pre- and inservice teacher education be considered as opposed to dealing with inservice education separately?

The rate of success of the ninety-seven programs strongly suggests that a great variety of objectives can be accomplished through inservice education. One way of answering questions 1. and 9. is to say any teaching skills or attributes that can be <u>better</u> developed inservice should be included among purposes of inservice education. Pre-service education should give attention to the others. The findings indicate that teacher attitudes and values are more likely to undergo positive changes in school-based programs; similarly, more complex behaviors. Skills that are best learned in a demonstration-trial-feedback-retrial cycle may well be learned more effectively and efficiently in school-based programs. To the extent that the pre-service program would have difficulty with sponsoring school-based activities, the task would logically belong to inservice programs.

The <u>potential</u> purposes of inservice education are so numerous and varied that the question "What purposes for inservice education" should probably be replaced with "What priorities?" One can logically argue that priority should be assigned not so much to particular <u>objectives</u> but to the careful development and selection of <u>procedures</u> and materials for a variety of inservice education objectives. When teachers identify

and pursue their own professional priorities the research record shows a greater likelihood of improved teaching and student achievement. The procedures, the structure, for helping teachers do that are what need careful attention.

Some guidelines for answering questions 2., 3. and 6. are implied in the findings of the research. Active teacher participation in planning and conducting inservice activities has a strong record in the research findings. When outside resource persons are engaged to direct school-based inservice activities, the findings suggest that the activities will be more successful if school personnel are partners in the planning. When the college is the setting for inservice programs, movement toward more active teacher participation in the planning and conduct of courses will probably need to be initiated by college personnel. The college course that is likely to be helpful to teachers is one that is kept tuned to teachers' perceptions of their professional needs.

Teacher participation in planning of inservice education also represents an approach to answering question 7. Pursuing one's own professional goals, with the encouragement of the employer, would seem to be a workable combination of intrinsic and extrinsic motivation.

Finally, the question of evaluation of inservice education (8.). Evaluation has the function of validating past action and guiding future decisions. In terms of inservice program development, evaluation serves to improve procedures and content. In terms of finances, it serves to give an account of the effectiveness of money spent and to justify future financing of inservice programs. In this era of accountability, programs that do not show effectiveness through careful evaluation are not likely to continue receiving support from tax revenues (questions 4. and 5.).

In the process of conducting this review of research we made many inquiries and learned that very few school systems carry on careful evaluation of inservice education, even large school districts. Nearly all the studies reviewed were conducted by persons outside the school systems. We hope this review highlights the value of and need for evaluation by school personnel. The value of teacher participation in planning and conducting inservice programs extends logically to evaluation of programs as well. Sound evaluation and research are not beyond the capacity of even small school districts.

The fourteen category scheme used for classifying programs in this review can serve as a model - not only for conceptualizing program components and planning evaluation, but also for reporting outcomes of programs. Uniform means of reporting were noticeably lacking in the research reports reviewed. Typically, the reports gave the topic of an inservice program, the research procedures and outcomes, but neglected specifics about how the program was organized and conducted. The fourteen categories may need expanding or refinement, but used in their present form to guide report writing they would substantially improve communicability of research reports.

As another sort of guide to designing evaluation or research on inservice programs, brief descriptions of four well designed studies are included as Appendix B. Their designs show attention to possible sources of invalidity of outcomes. Many studies were excluded from this review because that attention was not given. If we had excluded all but those that give scrupulous attention to validity issues, the review would have contained few studies.

A final word to readers in school systems: If you have reports

of inservice program evaluations or research you wish to share with others, ERIC serves that purpose. Surely the body of sound studies on inservice education is larger than ninety-seven.

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APPENDIX A

FINDINGS OF THE REVIEW IN TABLE FORMAT

(Keyed to finding numbers and numbers of the studies as listed in the bibliography)

TABLE 1

IA: Program Effects On Teacher Behavior (Categories B1 and B3) Listed By College Or School Setting And By Complexity Of The Behavior

College-based Programs	
Positive Outcomes n=27	No Signif. Diff. n=5
2, 4, 5, 8, 13*, 14*, 19*, 23, 25, 32, 35, 46, 47, 55, 57, 59*, 62, 67, 68, 71*, 76, 79, 80*, 82, 83, 85, 86	13*, 21*, 24, 27, 70

School-based Programs	
Positive Outcomes n=54	No Signif. Diff. n=9
1, 2, 3, 6, 7, 9*, 11a, 11b, 11c, 11d, 11e, 11f, 11g, 12, 15, 17*, 18, 20, 22*, 26, 28, 30, 31, 36, 38*, 39, 40, 42, 43, 45, 48, 49, 50, 51, 52, 53, 54, 56, 60, 61, 63, 65, 66, 69a, 72, 73, 74*, 75, 77, 78, 81, 88, 89*, 90	16, 33, 34, 37, 58, 64, 69b, 84, 87

"_" Designates programs with complex objectives.

* Designates programs that had mixed results; some positive, some not significantly different.

TABLE 2

IB: Program Effects On Teacher Attitudes, Listed By College Or School Setting

College-based Programs	
Positive Outcomes n=8	No Signif. Diff. n=7
4, 5, 41, 47, 79, 80*, 83, 86	14, 21, 27, 59, 62, 70, 71

School-based Programs	
Positive Outcomes n=23	No Signif. Diff. n=4
1, 3, 6, 7, 12, 17, 26, 29, 36, 43, 44, 49, 50, 52, 53, 60, 69a, 69b, 72, 73, 77, 78, 90	16, 64, 84, 89

TABLE 3

IC: Program Effects In Minicourses, Listed By College Or School Setting And By Complexity Of The Objective(s)

College-based Programs		
Positive n=7	Mixed n=1	No Signif. Diff. n=0
2, 23, 46, 55, 68, 71, 86	21	

School-based Programs		
Positive n=7	Mixed n=1	No Signif. Diff. n=0
11a, 11b, 11c, 11d, 11e, 11f, 11g	38	

"_" Designates complex behavior objective(s).

TABLE 4

II: Program Effects Listed By Mediation

Multi-mediation

Positive Outcomes:	1, 4, 7, 8, 11a, 11b, 11c, 11d, 11e, 11f, 11g, 18, 23, 26, 32, 39, 41, 43, 45, 46, 48, 49, 54, 56, 60, 61, 62, 63, 65, 66, 67, 69a, 72, 73, 75, 77, 78, 79, 81, 90	(n=40)
Mixed Outcomes:	14, 17, 22, 69b, 74, 80	(n=6)
No Signif. Diff.:	13, 21, 24, 37, 44, 64, 70, 84	(n=8)

Lecture-discussion

Positive Outcomes:	2a, 2b, 5, 12, 28, 35, 36, 43, 47, 51, 52, 53, 55, 57, 63, 67, 78, 81, 82, 83, 86, 90	(n=22)
Mixed Outcomes:	38, 59, 71	(n=3)
No Signif. Diff.:	24. 27, 87	(n=3)

Video and/or Audio Taping

Positive Outcomes:	6, 11a, 11b, 11c, 11d, 11e, 11f, 11g, 12, 15, 18, 20, 30, 40, 41, 50, 73, 76, 78, 79, 81	(n=21)
Mixed Outcomes:	9, 19	(n=2)
No Signif. Diff.:	16, 34	(n=2)

Books

Positive Outcomes:	2, 36, 47, 52, 53, 57, 67, 82, 85	(n=9)
Mixed Outcomes:	38	(n=1)
No Signif. Diff.:	27	(n=1)

Modules and Other Self-instruction Packets

Positive Outcomes:	48, 66, 68, 73	(n=4)
Mixed Outcomes:	17	(n=1)
No Signif. Diff.:	84	(n=1)

Simulations, Other Structured Group Activities

Positive Outcomes:	3, 42, 43, 79	(n=4)
No Signif. Diff.:	44, 58	(n=2)

Observation System As A Medium Of Instruction

Cognitive, Behavioral:

Positive Outcomes:	1, 26, 31, 46, 63, 76, 89	(n=7)
Mixed Outcomes:	17, 74	(n=2)
No Signif. Diff.:	9, 33, 59	(n=3)

Attitude Outcomes:

Positive Outcomes:	17, 26	(n=2)
No Signif. Diff.:	59, 89	(n=2)

Pupil Outcomes:

Positive Outcomes:	65, 76	(n=2)
No Signif. Diff.:	9, 33, 74	(n=3)

TABLE 5

IIIA & IIIB: Outcomes Of School-based Inservice Programs That Involve School Personnel In Planning And Conducting Training Activities, And Programs That Are Planned And Conducted Solely By College And Other Outside Personnel

Directed By College And Other Outside Personnel Only (n=34)

Positive Outcomes n=20	Mixed Outcomes n=8	No Signif. Differences n=6
1, 2, 3, 7, 28, 29 40, 42, 49, 50, 52 54, 60, 63, 69a, 72, 73, 77, 88, 90	16, 17, 38, 44, 64, 69b, 74, 89	9, 33, 34, 37, 58, 84

Teachers Involved

Positive Outcomes n=7	Mixed Outcomes n=1	No Signif. Differences n=0
18, 20, 26, 36, 45, 56, 81	22	

Supervisors and/or Administrators Involved

Positive Outcomes n=4	Mixed Outcomes n=0	No Signif. Differences n=0
15, 31, 45, 81		

TABLE 6

IIIC: Outcomes Of School-based Inservice Programs Conducted By School Supervisors And/Or Administrators, Compared With School-based Programs That Involve College And Other Outside Personnel

Conducted By School Supervisors And/Or Administrators (n=6)

Positive Outcomes n=5	Mixed Outcomes n=0	No Signif. Differences n=1
12, 43, 51, 75, 78		87

Programs Involving College Or Other Outside Personnel (n=44)

Positive Outcomes n=29	Mixed Outcomes n=9	No Signif. Differences n=6
1, 2, 3, 7, 15, 18, 20, 26, 28, 29, 31, 36, 40, 42, 45, 49, 50, 52, 54, 56, 60, 63, 69a, 72, 73, 77, 81, 88, 90	16, 17, 22, 38, 44, 64, 69b, 74, 89	9, 33, 34, 37, 58, 84

TABLE 7

IIID: Outcomes Of Programs Emphasizing Self-Instruction By Teachers (All Are School-based)

Positive Outcomes: 6, 11a, 11b, 11c, 11d, 11e, 11f, 11g, 15, 26, 30, 39, 40, 48, 53, 56 (n=17)

No Significant Difference: None

TABLE 8

IVA: Outcomes Of Inservice Programs Classified By Kinds Of Objectives Of The Programs

Programs Having Information And Concept Objectives

Positive Outcomes:	8, 16, 18, 21, 22, 25, 26, 35, 42, 46, 47, 53, 55, 57, 62, 66, 67, 68, 69b, 77, 79, 81, 82, 85, 90	(n=25)
Mixed Outcomes:	19, 38	(n=2)
No Signif. Diff.:	13, 64, 84	(n=3)

Programs Having Attitude Or Value Objectives

Positive Outcomes:	1, 3, 4, 5, 6, 7, 12, 17, 26, 29, 36, 41, 43, 44, 47, 49, 50, 52, 53, 60, 62, 69a, 69b, 72, 73, 77, 78, 79, 83, 86, 90	(n=31)
Mixed Outcomes:	80	(n=1)
No Signif. Diff.:	14, 16, 21, 27, 59, 64, 70, 71, 84, 89	(n=10)

Programs Having Overt Teaching Objectives

Positive Outcomes:	1, 2, 3, 4, 6, 8, 11a, 11b, 11c, 11d, 11e, 11f, 11g, 14, 15, 18, 20, 23, 26, 28, 30, 31, 32, 36, 39, 40, 42, 43, 45, 46, 48, 49, 50, 51, 54, 55, 56, 59, 60, 61, 63, 65, 66, 68, 69a, 71, 72, 73, 75, 76, 78, 81, 85, 88, 89	(n=55)
Mixed Outcomes:	17, 80	(n=2)
No Signif. Diff.:	9, 16, 21, 22, 24, 33, 34, 37, 44, 58, 69b, 70, 74, 87	(n=14)

TABLE 9

IVB: Outcomes Of Inservice Programs Classified By The Kinds Of Mesurement: Consequent Pupil Outcomes, And Teaching Behavior Outcomes

Outcomes Measured By Pupil Behaviors (C6)

Positive Outcomes:	1, 2, 3, 12, 18, 28, 38a, 39, 42, 49, 50, 51, 61, 63, 66, 68, 69, 72, 76, 81, 82, 85, 88
No Signif. Diff.:	9*, 13*, 16*, 21*, 22*, 24, 33, 37, 38b, 69b, 74*, 84, 87*

*Programs in which teaching behavior was significantly changed in the positive direction while pupil behavior showed no significant differences.

TABLE 10

V: Outcomes Of Inservice Programs Classified By Patterns Of Management Of Inservice Activities

Individualized Programs (n=43)

Positive Outcomes:	3, 6, 11a, 11b, 11c, 11d, 11e, 11f, 11g, 12, 15, 17, 18, 20, 23, 30, 32, 39, 40, 41, 48, 49, 50, 53, 61, 62, 67, 68, 73, 75, 76, 77, 78, 81, 90	(n=35)
Mixed Outcomes:	19, 22, 59	(n=3)
No Signif. Diff.:	9, 33, 37, 58, 89	(n=5)

Active (n=66)

Positive Outcomes:	1, 2, 3, 6, 8, 11a, 11b, 11d, 11e, 11f, [illegible], 12, 15, 18, 20, 23, 25, 26, 29, 30, 32, 36, 39, [illegible], 41, 42, 43, 45, 46, 48, 49, 50, 52, 53, 56, 61, 63, 65, 66, 67, 68, 69a, 72, 73, 75, 76, 77, 78, 79, 81, 83, 85, 88, 90	(n=54)
Mixed Outcomes:	14, 17, 22, 69b, 74	(n=5)
No Signif. Diff.:	13, 33, 37, 44, 58, 87, 89	(n=7)

Trial And Feedback (n=61)

Positive Outcomes:	1, 2, 3, 4, 8, 11a, 11b, 11c, 11d, 11e, 11f, 11g, 12, 15, 18, 20, 23, 25, 26, 30, 31, 35, 40, 41, 42, 43, 45, 46, 48, 49, 50, 51, 53, 55, 56, 61, 62, 63, 65, 66, 68, 69a, 72, 73, 75, 76, 77, 78, 79, 88	(n=50)
Mixed Outcomes:	14, 17, 19, 69b, 74	(n=5)
No Signif. Diff.:	21, 33, 37, 44, 87, 89	(n=6)

Teacher Sharing (n=38)

Positive Outcomes:	3, 5, 6, 8, 12, 18, 26, 29, 31, 32, 36, 41, 43, 45, 48, 49, 51, 52, 53, 56, 61, 66, 67, 69a, 72, 75, 76, 79, 83, 86, 90	(n=31)
Mixed Outcomes:	17, 19, 69b	(n=3)
No Signif. Diff.:	9, 33, 44, 58	(n=4)

Programmatic (n=18)

Positive Outcomes:	1, 6, 8, 12, 18, 31, 39, 41, 48, 50, 61, 66, 73, 75, 78, 81, 90	(n=17)
Mixed Outcomes:	17	(n=1)

Emergent (n=21)

Positive Outcomes:	3, 6, 12, 18, 36, 39, 40, 41, 48, 50, 52, 53, 61, 72, 73, 76, 77, 78, 83, 90	(n=20)
No Signif. Diff.:	33	(n=1)

Self-initiated (n=3)

Positive Outcomes:	48, 67, 68	(n=3)

TABLE 11

V: Outcomes Of Inservice Programs Classified As Incorporating Four Or More Of The Seven "Desirable" Management Features

Positive Outcomes n=24	Mixed Outcomes n=2	No Signif. Diff. n=1
3, 6, 8, 12, 18, 39, 40, 41, 48, 49, 50, 53, 61, 66, 67, 68, 72, 73, 75, 76, 77, 78, 83, 90	17	33

APPENDIX B

Four Studies That Represent Different Approaches To Research On Inservice Education

Simulation: In-service Education For Teachers Of Reading[1]

The in-service education program reported in this study offered assistance to teachers in the selection of reading materials at appropiate instructional levels for each pupil in the classroom. Techniques of simulation were used in the in-service program as a means of bridging the gap between educational theory and educational practice. The in-service program was evaluated in terms of change in instruction that occurred in the classrooms of the teachers who participated.

First, it was hypothesized that an in-service education program designed to train teachers to determine pupils' instructional reading levels in simulation-type experiences increases teachers' awareness of pupils' instructional levels. Second, it was hypothesized that teachers participating in a simulation-type in-service program scheduled before they organize classroom reading groups demonstrate a greater awareness of pupils' instructional reading levels in the classroom than teachers who experience the in-service program later in the school year.

Using three stratified random samples of thirty-two teachers each from grades 2 through 5, a 3-group posttest-only control group research design was employed to determine the effectiveness of the in-service program. Pupils were selected randomly from each teacher's classroom. Differences between the grade level of pupils' readers and their performance on McCracken's Standard Reading Inventory constituted the measure of teacher awareness. The Informal Reading Inventory Instructional Process developed by Beldin, Utsey, and Wallen in "Diagnostic Techniques in Teaching Reading, Part I" was adapted for use in this study.

Outcomes: both hypotheses were accepted. The IRI instructional process appeared to be validated for in-service teachers. Finally, the study showed that a fully experimental design can be used in an in-service setting.

The coding for the study was as follows, situational design - workshop; objectives for teacher change - cognitive/knowledge, affective/attitude, performance/behavior; measurement level - consequence; research/evaluation plan - experimental; mediation - simulation/games; influence agent - college instructor; common activities, other-directed, teacher active, preplanned design, action-feedback, separate work, single-shot design, and complex behavior goal.

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[1] Kasdon, Lawrence M. and Kelly, Dean, "Simulation: In-Service Education For Teachers Of Reading." The Journal Of Experimental Education, 1969, Vol. 38(1), 81-85.

Minicourse Instructional Model[1]

Effective Questioning in a Classroom Discussion[2]

Goal: To improve the quality of both teacher and pupil participation in class discussion.

Skill Objectives: Observing the following rules--
(1) Should not repeat his own questions.
(2) Should not answer his own questions.
(3) Should not repeat pupil answers.
Calling on nonvolunteers
Prompting
Framing comprehension or concept questions
Framing analysis questions
Framing evaluative questions

Design of Study: The course included 74 teachers (English and Social Studies) in California. A pre- and post-course comparison was made from video tapes of the teaching skills covered. No control group was used.

Teacher Activities: The minicourse is a self-instructional program for inservice teachers. Participants work through carefully preplanned materials. In this study, teachers were given a list of skills to be covered in the evaluation prior to the beginning of the course. The standard procedure developed by the Far West Laboratory was utilized--

Reads Teacher Handbook ----▶ Views Instructional Films (explanation of microteaching approach) ----▶ Views Model Film (demonstrating skills) ----▶ Plans Lesson ----▶ Microteaches Lesson ----▶ Views Replay of Microteach ----▶ Replans Lesson ----▶ Reteaches Lesson ----▶ Views Each Replay.

Results: The major objective of increasing teacher use of higher cognitive questions was attained. Fifty-five of the seventy-four teachers showed a change of 22%. Data revealed that pupil participation increased and teacher talk decreased. Student responses not only increased in length but in quality. Increases in teacher clarification and prompting were also noted.

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1 An adaptation of the microteaching approach developed by the Far West Laboratory for Educational Research and Development.

2 Borg, Walter R., and others, The Mini-Course: A Microteaching Approach to Teacher Education, (California: MacMillan Educational Services, Inc.(1970, pp. 128-138.

An Eight-week NDEA Summer Institute For School Psychologists[1]

General goal: the development of more adequate communication skills in school psychologists.

Secondary goal: focused on the effort to provide a methodological model for the evaluation of the behavioral outcomes of short-term intensive training programs.

Thirty participants were selected from a pool of applicants on a randomized basis. Active and passive control groups were compared with the participant group. Independent variables: didactic instruction, television experience (feed-back), group critiquing, and micro-consultation procedure.

Instruction consisted of a formal set of courses; seminar activity, laboratory experiences (in the college and field) and special consultants.

Behavior was evaluated from audio tapes obtained from actual counseling situations. Evaluation was based on these tapes as well as video tapes made during the institute.

Results: The participant group showed significant gains over the passive control group and the active control group that had been given exposure to video tape feedback without subsequent instruction.

The coding for this study was as follows; situational design - institute; objectives for teacher change - cognitive/knowledge, performance/behavior; measurement level - conceptual, unconstrained performance; research/evaluation plan - experimental; mediation - multi-mediation; influence agent - college instructor; common activities, other-directed, teacher receptive, preplanned design, action-feedback, separate work, single-shot design and complex objective goal.

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1 Barclay, James R., Changing the Behavior of School Psychologists: A Training Rationale and Method, California State College, Hayward. Washington, D.C.: Office of Education, 1968. 299 p. ED 024 993.

Research On A Course In Interaction Analysis For Inservice Teachers[1]

Purposes of the study:

1) to develop a series of five sound-filmstrips dealing with classroom verbal behavior
2) to determine whether participation in a course using these materials would produce a change in the verbal influence behavior of teachers
3) to determine whether a teacher is more likely to change his behavior if he participates in a course in which the instructor's style is similar to his own style of teaching.

A stipend of $75.00 or three credits was offered as an inducement to draw a more typical sample of teachers. Fifty-one teachers participated.

The course was concerned with the analysis of teachers' use of authority in the classroom. It included practice in controlling the use of authority to achieve teacher goals. Four weeks were devoted to teaching the basic concepts of interaction analysis, three weeks to application of these concepts with a consultant available to work with teachers upon request, and two weeks to the evaluation of the course.

The following measurements were used in the study: Observation with Interaction Analysis (experimental and control teachers), Minnesota Student Attitude Inventory (pupils of participating teachers), Minnesota Teacher Attitude Inventory, IPAT 16 PF (Cattell, Saunders, and Stice), Runner studies in attitude patterns and post-meeting reaction sheets.

Four hypotheses were developed regarding the relationship between the type of inservice course and the teacher's pre-training style of teaching:

1) Indirect teachers, i.e. above the median in I/D in their own teaching, will gain the most when exposed to an indirect inservice program.
2) The teachers below the median on being direct will gain the most when exposed to a direct program of inservice training.
3) Direct teachers, when exposed to an indirect inservice training program, will show less gain than the above two groups, i. e., when there is incompatibility between their style and the style of the instructor.
4) Indirect teachers who are exposed to a direct inservice program will show the least gain.

The hypotheses were confirmed by the outcomes.

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1 Storlie, Theodore R., "Applications of Interaction Analysis to In-Service Training of Teachers," Interaction Analysis: Theory, Research and Application, 1967, 262-270.